Managing Configuration Files

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Prerequisites for Managing Configuration Files

- You should have at least a basic familiarity with the Cisco IOS environment and the command-line interface.
- You should have at least a minimal configuration running on your system. You can create a basic configuration file using the **setup** command.

Restrictions for Managing Configuration Files

- Many of the Cisco IOS commands described in this document are available and function only in certain configuration modes on the device.
- Some of the Cisco IOS configuration commands are only available on certain device platforms, and the command syntax may vary on different platforms.

Information About Managing Configuration Files

Types of Configuration Files

Configuration files contain the Cisco IOS software commands used to customize the functionality of your Cisco device. Commands are parsed (translated and executed) by the Cisco IOS software when the system is booted (from the startup-config file) or when you enter commands at the CLI in a configuration mode.

Startup configuration files (startup-config) are used during system startup to configure the software. Running configuration files (running-config) contain the current configuration of the software. The two configuration

files can be different. For example, you may want to change the configuration for a short time period rather than permanently. In this case, you would change the running configuration using the **configure terminal** EXEC command but not save the configuration using the **copy running-config startup-config** EXEC command.

To change the running configuration, use the **configure terminal** command, as described in the Modifying the Configuration File, on page 9 section. As you use the Cisco IOS configuration modes, commands generally are executed immediately and are saved to the running configuration file either immediately after you enter them or when you exit a configuration mode.

To change the startup configuration file, you can either save the running configuration file to the startup configuration using the **copy running-config startup-config** EXEC command or copy a configuration file from a file server to the startup configuration (see the "Copying a Configuration File from a TFTP Server to the Router" section for more information).

Configuration Mode and Selecting a Configuration Source

To enter configuration mode on the device, enter the **configure** command at the privileged EXEC prompt. The Cisco IOS software responds with the following prompt asking you to specify the terminal, memory, or a file stored on a network server (network) as the source of configuration commands:

```
Configuring from terminal, memory, or network [terminal]?
```

Configuring from the terminal allows you to enter configuration commands at the command line, as described in the following section. See the "Re-executing the Configuration Commands in the Startup Configuration File" section for more information.

Configuring from the network allows you to load and execute configuration commands over the network. See the "Copying a Configuration File from a TFTP Server to the Switch" section for more information.

Configuration File Changes Using the CLI

The Cisco IOS software accepts one configuration command per line. You can enter as many configuration commands as you want. You can add comments to a configuration file describing the commands you have entered. Precede a comment with an exclamation point (!). Because comments are *not* stored in NVRAM or in the active copy of the configuration file, comments do not appear when you list the active configuration with the **show running-config** or **more system:running-config** EXEC command. Comments are not displayed when you list the startup configuration with the **show startup-config** or **more nvram:startup-config** EXEC mode command. Comments are stripped out of the configuration file when it is loaded onto the device. However, you can list the comments in configuration files stored on a File Transfer Protocol (FTP), Remote Copy Protocol (RCP), or Trivial File Transfer Protocol (TFTP) server. When you configure the software using the CLI, the software executes the commands as you enter them.

Location of Configuration Files

Configuration files are stored in the following locations:

- The running configuration is stored in RAM.
- On all platforms except the Class A Flash file system platforms, the startup configuration is stored in nonvolatile random-access memory (NVRAM).

- On Class A Flash file system platforms, the startup configuration is stored in the location specified by the CONFIG_FILE environment variable (see the Specifying the CONFIG_FILE Environment Variable on Class A Flash File Systems , on page 30 section). The CONFIG_FILE variable defaults to NVRAM and can be a file in the following file systems:
  - **nvram:** (NVRAM)
  - **flash:** (internal flash memory)
  - **usbflash0:** (external usbflash file system)
  - **usbflash1:** (external usbflash file system)

Copy Configuration Files from a Network Server to the Device

You can copy configuration files from a TFTP, rcp, or FTP server to the running configuration or startup configuration of the device. You may want to perform this function for one of the following reasons:

- To restore a backed-up configuration file.
- To use the configuration file for another device. For example, you may add another device to your network and want it to have a similar configuration to the original device. By copying the file to the new device, you can change the relevant parts rather than recreating the whole file.
- To load the same configuration commands on to all of the devices in your network so that all of the devices have similar configurations.

The **copy**{**ftp:** | **rcp:** | **tftp:system:running-config**} EXEC command loads the configuration files into the device as if you were typing the commands on the command line. The device does not erase the existing running configuration before adding the commands. If a command in the copied configuration file replaces a command in the existing configuration file, the existing command is erased. For example, if the copied configuration file contains a different IP address in a particular command than the existing configuration, the IP address in the copied configuration is used. However, some commands in the existing configuration may not be replaced or negated. In this case, the resulting configuration file is a mixture of the existing configuration file and the copied configuration file, with the copied configuration file having precedence.

To restore a configuration file to an exact copy of a file stored on a server, you need to copy the configuration file directly to the startup configuration (using the **copy ftp:**| **rcp:**| **tftp:**} **nvram:startup-config** command) and reload the device.

To copy configuration files from a server to a device, perform the tasks described in the following sections.

The protocol that you use depends on which type of server you are using. The FTP and rcp transport mechanisms provide faster performance and more reliable delivery of data than TFTP. These improvements are possible because the FTP and rcp transport mechanisms are built on and use the TCP/IP stack, which is connection-oriented.

Copying a Configuration File from the Device to a TFTP Server

In some implementations of TFTP, you must create a dummy file on the TFTP server and give it read, write, and execute permissions before copying a file over it. Refer to your TFTP documentation for more information.

Copying a Configuration File from the Device to an RCP Server

You can copy a configuration file from the device to an RCP server.

One of the first attempts to use the network as a resource in the UNIX community resulted in the design and implementation of the remote shell protocol, which included the remote shell (rsh) and remote copy (rcp) functions. Rsh and rcp give users the ability to execute commands remotely and copy files to and from a file system residing on a remote host or server on the network. The Cisco implementation of rsh and rcp interoperates with standard implementations.

The rcp **copy** commands rely on the rsh server (or daemon) on the remote system. To copy files using rcp, you need not create a server for file distribution, as you do with TFTP. You need only to have access to a server that supports the remote shell (rsh). (Most UNIX systems support rsh.) Because you are copying a file from one place to another, you must have read permission on the source file and write permission on the destination file. If the destination file does not exist, rcp creates it for you.

Although the Cisco rcp implementation emulates the functions of the UNIX rcp implementation—copying files among systems on the network—the Cisco command syntax differs from the UNIX rcp command syntax. The Cisco rcp support offers a set of **copy** commands that use rcp as the transport mechanism. These rcp **copy** commands are similar in style to the Cisco TFTP **copy** commands, but they offer an alternative that provides faster performance and reliable delivery of data. These improvements are possible because the rcp transport mechanism is built on and uses the TCP/IP stack, which is connection-oriented. You can use rcp commands to copy system images and configuration files from the device to a network server and vice versa.

You also can enable rcp support to allow users on remote systems to copy files to and from the device.

To configure the Cisco IOS software to allow remote users to copy files to and from the device, use the **ip rcmd rcp-enable** global configuration command.

Restrictions

The RCP protocol requires a client to send a remote username on each RCP request to a server. When you copy a configuration file from the device to a server using RCP, the Cisco IOS software sends the first valid username it encounters in the following sequence:

1. The username specified in the **copy** EXEC command, if a username is specified.
2. The username set by the **ip rcmd remote-username** global configuration command, if the command is configured.
3. The remote username associated with the current tty (terminal) process. For example, if the user is connected to the device through Telnet and was authenticated through the **username** command, the device software sends the Telnet username as the remote username.
4. The device host name.

For the RCP copy request to execute successfully, an account must be defined on the network server for the remote username. If the server has a directory structure, the configuration file or image is written to or copied from the directory associated with the remote username on the server. For example, if the system image resides in the home directory of a user on the server, you can specify that user name as the remote username.

Use the **ip rcmd remote-username** command to specify a username for all copies. (Rcmd is a UNIX routine used at the super-user level to execute commands on a remote machine using an authentication scheme based on reserved port numbers. Rcmd stands for “remote command”). Include the username in the **copy** command if you want to specify a username for that copy operation only.

If you are writing to the server, the RCP server must be properly configured to accept the RCP write request from the user on the device. For UNIX systems, you must add an entry to the .rhosts file for the remote user on the RCP server. For example, suppose the device contains the following configuration lines:

```
hostname Device1
ip rcmd remote-username User0
```

If the device IP address translates to device1.example.com, then the .rhosts file for User0 on the RCP server should contain the following line:

```
Device1.example.com Device1
```

Requirements for the RCP Username

The RCP protocol requires a client to send a remote username on each RCP request to a server. When you copy a configuration file from the device to a server using RCP, the Cisco IOS software sends the first valid username it encounters in the following sequence:

1. The username specified in the **copy** EXEC command, if a username is specified.
2. The username set by the **ip rcmd remote-username** global configuration command, if the command is configured.
3. The remote username associated with the current tty (terminal) process. For example, if the user is connected to the device through Telnet and is authenticated through the **username** command, the device software sends the Telnet username as the remote username.
4. The device host name.

For the RCP copy request to execute, an account must be defined on the network server for the remote username. If the server has a directory structure, the configuration file or image is written to or copied from the directory associated with the remote username on the server. For example, if the system image resides in the home directory of a user on the server, specify that user name as the remote username.

Refer to the documentation for your RCP server for more information.

Copying a Configuration File from the Device to an FTP Server

You can copy a configuration file from the device to an FTP server.

Understanding the FTP Username and Password

Note The password must not contain the special character '@'. If the character '@' is used, the copy fails to parse the IP address of the server.

The FTP protocol requires a client to send a remote username and password on each FTP request to a server. When you copy a configuration file from the device to a server using FTP, the Cisco IOS software sends the first valid username it encounters in the following sequence:

1. The username specified in the **copy** EXEC command, if a username is specified.
2. The username set by the **ip ftp username** global configuration command, if the command is configured.

3. Anonymous.

The device sends the first valid password it encounters in the following sequence:

1. The password specified in the **copy** command, if a password is specified.
2. The password set by the **ip ftp password** command, if the command is configured.
3. The device forms a password *username @devicename.domain* . The variable *username* is the username associated with the current session, *devicename* is the configured host name, and *domain* is the domain of the device.

The username and password must be associated with an account on the FTP server. If you are writing to the server, the FTP server must be properly configured to accept the FTP write request from the user on the device.

If the server has a directory structure, the configuration file or image is written to or copied from the directory associated with the username on the server. For example, if the system image resides in the home directory of a user on the server, specify that user name as the remote username.

Refer to the documentation for your FTP server for more information.

Use the **ip ftp username** and **ip ftp password** global configuration commands to specify a username and password for all copies. Include the username in the **copy** EXEC command if you want to specify a username for that copy operation only.

Copying files through a VRF

You can copy files through a VRF interface specified in the **copy** command. Specifying the VRF in the **copy** command is easier and more efficient as you can directly change the source interface without using a change request for the configuration.

Example

The following example shows how to copy files through a VRF, using the **copy** command:

```
Device# copy scp: bootflash-1: vrf test-vrf
Address or name of remote host [10.1.2.3]?
Source username [ScpUser]?
Source filename [/auto/tftp-server/ScpUser/vrf_test.txt]?
Destination filename [vrf_test.txt]?
Getting the vrf name as test-vrf
Password:
Sending file modes: C0644 10 vrf_test.txt
!
223 bytes copied in 22.740 secs (10 bytes/sec)
```

Copy Configuration Files from a Switch to Another Switch

You can copy the configurations from one switch to another. This is a 2-step process - Copy the configurations from the switch to the TFTP server, and then from TFTP to another switch.

To copy your current configurations from the switch, run the command **copy startup-config tftp:** and follow the instructions. The configurations are copied onto the TFTP server.

Then, login to another switch and run the command **copy tftp: startup-config** and follow the instructions. The configurations are now copied onto the other switch.

After the configurations are copied, to save your configurations, use **write memory** command and then either reload the switch or run the **copy startup-config running-config** command

Configuration Files Larger than NVRAM

To maintain a configuration file that exceeds the size of NVRAM, you should be aware of the information in the following sections.

Compressing the Configuration File

The **service compress-config** global configuration command specifies that the configuration file be stored compressed in NVRAM. Once the configuration file has been compressed, the device functions normally. When the system is booted, it recognizes that the configuration file is compressed, expands it, and proceeds normally. The **more nvram:startup-config** EXEC command expands the configuration before displaying it.

Before you compress configuration files, refer to the appropriate hardware installation and maintenance publication. Verify that your system's ROMs support file compression. If not, you can install new ROMs that support file compression.

The size of the configuration must not exceed three times the NVRAM size. For a 128-KB size NVRAM, the largest expanded configuration file size is 384 KB.

The **service compress-config** global configuration command works only if you have Cisco IOS software Release 10.0 or later release boot ROMs. Installing new ROMs is a one-time operation and is necessary only if you do not already have Cisco IOS Release 10.0 in ROM. If the boot ROMs do not recognize a compressed configuration, the following message is displayed:

```
Boot ROMs do not support NVRAM compression Config NOT written to NVRAM
```

Storing the Configuration in Flash Memory on Class A Flash File Systems

On class A Flash file system devices, you can store the startup configuration in flash memory by setting the **CONFIG_FILE** environment variable to a file in internal flash memory or flash memory in a PCMCIA slot.

See the Specifying the CONFIG_FILE Environment Variable on Class A Flash File Systems , on page 30 section for more information.

Care must be taken when editing or changing a large configuration. Flash memory space is used every time a **copy system:running-config nvram:startup-config** EXEC command is issued. Because file management for flash memory (such as optimizing free space) is not done automatically, you must pay close attention to available flash memory. Use the **squeeze** command to reclaim used space. We recommend that you use a large-capacity Flash card of at least 20 MB.

Loading the Configuration Commands from the Network

You can also store large configurations on FTP, RCP, or TFTP servers and download them at system startup. To use a network server to store large configurations, see the Copying a Configuration File from the Device to a TFTP Server , on page 10 and Configuring the Device to Download Configuration Files, on page 7 sections for more information on these commands.

Configuring the Device to Download Configuration Files

You can configure the device to load one or two configuration files at system startup. The configuration files are loaded into memory and read in as if you were typing the commands at the command line. Thus, the

configuration for the device is a mixture of the original startup configuration and the one or two downloaded configuration files.

Network Versus Host Configuration Files

For historical reasons, the first file the device downloads is called the network configuration file. The second file the device downloads is called the host configuration file. Two configuration files can be used when all of the devices on a network use many of the same commands. The network configuration file contains the standard commands used to configure all of the devices. The host configuration files contain the commands specific to one particular host. If you are loading two configuration files, the host configuration file should be the configuration file you want to have precedence over the other file. Both the network and host configuration files must reside on a network server reachable via TFTP, RCP, or FTP, and must be readable.

How to Manage Configuration File Information

Displaying Configuration File Information

To display information about configuration files, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show boot** **Example:** `Device# show boot`	Lists the contents of the BOOT environment variable (if set), the name of the configuration file pointed to by the CONFIG_FILE environment variable, and the contents of the BOOTLDR environment variable.
Step 3	**more** *file-url* **Example:** `Device# more 10.1.1.1`	Displays the contents of a specified file.
Step 4	**show running-config** **Example:** `Device# show running-config`	Displays the contents of the running configuration file. (Command alias for the **more system:running-config** command.)
Step 5	**show startup-config** **Example:** `Device# show startup-config`	Displays the contents of the startup configuration file. (Command alias for the **more nvram:startup-config** command.)

	Command or Action	Purpose
		On all platforms except the Class A Flash file system platforms, the default startup-config file usually is stored in NVRAM. On the Class A Flash file system platforms, the CONFIG_FILE environment variable points to the default startup-config file. The CONFIG_FILE variable defaults to NVRAM.

Modifying the Configuration File

The Cisco IOS software accepts one configuration command per line. You can enter as many configuration commands as you want. You can add comments to a configuration file describing the commands you have entered. Precede a comment with an exclamation point (!). Because comments are *not* stored in NVRAM or in the active copy of the configuration file, comments do not appear when you list the active configuration with the **show running-config** or **more system:running-config** EXEC commands. Comments do not display when you list the startup configuration with the **show startup-config** or **more nvram:startup-config** EXEC mode commands. Comments are stripped out of the configuration file when it is loaded onto the device. However, you can list the comments in configuration files stored on a File Transfer Protocol (FTP), Remote Copy Protocol (RCP), or Trivial File Transfer Protocol (TFTP) server. When you configure the software using the CLI, the software executes the commands as you enter them. To configure the software using the CLI, use the following commands in privileged EXEC mode:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**configuration command** **Example:** `Device(config)# configuration command`	Enter the necessary configuration commands. The Cisco IOS documentation set describes configuration commands organized by technology.
Step 4	Do one of the following: • **end** • **^Z**	Ends the configuration session and exits to EXEC mode. **Note**

	Command or Action	Purpose
	Example: `Device(config)# end`	When you press the Ctrl and Z keys simultaneously, ^Z is displayed to the screen.
Step 5	**copy system:running-config nvram:startup-config** **Example:** `Device# copy system:running-config nvram:startup-config`	Saves the running configuration file as the startup configuration file. You may also use the **copy running-config startup-config** command alias, but you should be aware that this command is less precise. On most platforms, this command saves the configuration to NVRAM. On the Class A Flash file system platforms, this step saves the configuration to the location specified by the CONFIG_FILE environment variable (the default CONFIG_FILE variable specifies that the file should be saved to NVRAM).

Examples

In the following example, the device prompt name of the device is configured. The comment line, indicated by the exclamation mark (!), does not execute any command. The **hostname** command is used to change the device name from device to new_name. By pressing Ctrl-Z (^Z) or entering the **end** command, the user quits configuration mode. The **copy system:running-config nvram:startup-config** command saves the current configuration to the startup configuration.

```
Device# configure terminal
Device(config)# !The following command provides the switch host name.
Device(config)# hostname new_name
new_name(config)# end
new_name# copy system:running-config nvram:startup-config
```

When the startup configuration is NVRAM, it stores the current configuration information in text format as configuration commands, recording only non-default settings. The memory is checksummed to guard against corrupted data.

Note Some specific commands might not get saved to NVRAM. You need to enter these commands again if you reboot the machine. These commands are noted in the documentation. We recommend that you keep a list of these settings so that you can quickly reconfigure your device after rebooting.

Copying a Configuration File from the Device to a TFTP Server

To copy configuration information on a TFTP network server, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy system:running-config tftp:** [[[*//location*]*/directory*]*/filename*] **Example:** `Device# copy system:running-config tftp: //server1/topdir/file10`	Copies the running configuration file to a TFTP server.
Step 3	**copy nvram:startup-config tftp:** [[[*//location*]*/directory*]*/filename*] **Example:** `Device# copy nvram:startup-config tftp: //server1/1stdir/file10`	Copies the startup configuration file to a TFTP server.

Examples

The following example copies a configuration file from a device to a TFTP server:

```
Device# copy system:running-config tftp://172.16.2.155/tokyo-confg
Write file tokyo-confg on host 172.16.2.155? [confirm] Y
Writing tokyo-confg!!! [OK]
```

What to Do Next

After you have issued the **copy** command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from the Device to an RCP Server

To copy a startup configuration file or a running configuration file from the device to an RCP server, use the following commands beginning in privileged EXEC mode:

Procedure

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ip rcmd remote-username** *username* **Example:** `Device(config)# ip rcmd remote-username NetAdmin1`	(Optional) Changes the default remote username.
Step 4	**end** **Example:** `Device(config)# end`	(Optional) Exits global configuration mode.
Step 5	Do one of the following: • **copy system:running-config rcp:** [[[//[*username*@]*location*]/*directory*]/*filename*] • **copy nvram:startup-config rcp:** [[[//[*username*@]*location*]/*directory*]/*filename*] **Example:** `Device# copy system:running-config rcp://NetAdmin1@example.com/dir-files/file1`	• Specifies that the device running configuration file is to be stored on an RCP server or • Specifies that the device startup configuration file is to be stored on an RCP server

Examples

Storing a Running Configuration File on an RCP Server

The following example copies the running configuration file named runfile2-confg to the netadmin1 directory on the remote host with an IP address of 172.16.101.101:

```
Device# copy system:running-config rcp://netadmin1@172.16.101.101/runfile2-confg
Write file runfile2-confg on host 172.16.101.101?[confirm]
Building configuration...[OK]
Connected to 172.16.101.101
Device#
```

Storing a Startup Configuration File on an RCP Server

The following example shows how to store a startup configuration file on a server by using RCP to copy the file:

```
Device# configure terminal

Device(config)# ip rcmd remote-username netadmin2

Device(config)# end

Device# copy nvram:startup-config rcp:

Remote host[]? 172.16.101.101

Name of configuration file to write [start-confg]?
Write file start-confg on host 172.16.101.101?[confirm]
![OK]
```

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from the Device to the FTP Server

To copy a startup configuration file or a running configuration file from the device to an FTP server, complete the following tasks:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode on the device.
Step 3	**ip ftp username** *username* **Example:** `Device(config)# ip ftp username NetAdmin1`	(Optional) Specifies the default remote username.
Step 4	**ip ftp password** *password* **Example:** `Device(config)# ip ftp password adminpassword`	(Optional) Specifies the default password.

	Command or Action	Purpose
Step 5	**end** **Example:** `Device(config)# end`	(Optional) Exits global configuration mode. This step is required only if you override the default remote username or password (see Steps 2 and 3).
Step 6	Do one of the following: • **copy system:running-config ftp:** [[[//[*username* [**:***password*]**@**]*location*]/*directory*]/*filename*] or • **copy nvram:startup-config ftp:** [[[//[*username* [**:***password*]**@**]*location*]/*directory*]/*filename*] **Example:** `Device# copy system:running-config ftp:`	Copies the running configuration or startup configuration file to the specified location on the FTP server.

Examples

Storing a Running Configuration File on an FTP Server

The following example copies the running configuration file named runfile-confg to the netadmin1 directory on the remote host with an IP address of 172.16.101.101:

```
Device# copy system:running-config ftp://netadmin1:mypass@172.16.101.101/runfile-confg
Write file runfile-confg on host 172.16.101.101?[confirm]
Building configuration...[OK]
Connected to 172.16.101.101
Device#
```

Storing a Startup Configuration File on an FTP Server

The following example shows how to store a startup configuration file on a server by using FTP to copy the file:

```
Device# configure terminal

Device(config)# ip ftp username netadmin2

Device(config)# ip ftp password mypass

Device(config)# end

Device# copy nvram:startup-config ftp:

Remote host[]? 172.16.101.101

Name of configuration file to write [start-confg]?
Write file start-confg on host 172.16.101.101?[confirm]
![OK]
```

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from a TFTP Server to the Device

To copy a configuration file from a TFTP server to the device, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy tftp:** [[[*//location*]*/directory*]*/filename*] **system:running-config** **Example:** `Device# copy tftp://server1/dir10/datasource system:running-config`	Copies a configuration file from a TFTP server to the running configuration.
Step 3	**copy tftp:** [[[*//location*]*/directory*]*/filename*] **nvram:startup-config** **Example:** `Device# copy tftp://server1/dir10/datasource nvram:startup-config`	Copies a configuration file from a TFTP server to the startup configuration.
Step 4	**copy tftp:** [[[*//location*]*/directory*]*/filename*] **flash-[n]:/directory/startup-config** **Example:** `Device# copy tftp://server1/dir10/datasource flash:startup-config`	Copies a configuration file from a TFTP server to the startup configuration.

Examples

In the following example, the software is configured from the file named **tokyo-confg** at IP address 172.16.2.155:

```
Device# copy tftp://172.16.2.155/tokyo-confg system:running-config
```

```
Configure using tokyo-confg from 172.16.2.155? [confirm] Y

Booting tokyo-confg from 172.16.2.155:!!! [OK - 874/16000 bytes]
```

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from the rcp Server to the Device

To copy a configuration file from an rcp server to the running configuration or startup configuration, complete the following tasks:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	(Optional) Enters configuration mode from the terminal. This step is required only if you override the default remote username (see Step 3).
Step 3	**ip rcmd remote-username** *username* **Example:** `Device(config)# ip rcmd remote-username NetAdmin1`	(Optional) Specifies the remote username.
Step 4	**end** **Example:** `Device(config)# end`	(Optional) Exits global configuration mode. This step is required only if you override the default remote username (see Step 2).
Step 5	Do one of the following: • **copy rcp:**[[*//username@location/directory/filename*]**system:running-config** • **copy rcp:**[[*//username@location/directory/filename*]**nvram:startup-config** **Example:** `Device# copy`	Copies the configuration file from an rcp server to the running configuration or startup configuration.

	Command or Action	Purpose
	`rcp://[user1@example.com/dir10/fileone] nvram:startup-config`	

Examples

Copy RCP Running-Config

The following example copies a configuration file named host1-confg from the netadmin1 directory on the remote server with an IP address of 172.16.101.101, and loads and runs the commands on the device:

```
device# copy rcp://netadmin1@172.16.101.101/host1-confg system:running-config
Configure using host1-confg from 172.16.101.101? [confirm]
Connected to 172.16.101.101
Loading 1112 byte file host1-confg:![OK]
device#
%SYS-5-CONFIG: Configured from host1-config by rcp from 172.16.101.101
```

Copy RCP Startup-Config

The following example specifies a remote username of netadmin1. Then it copies the configuration file named host2-confg from the netadmin1 directory on the remote server with an IP address of 172.16.101.101 to the startup configuration.

```
device# configure terminal
device(config)# ip rcmd remote-username netadmin1
device(config)# end
device# copy rcp: nvram:startup-config
Address of remote host [255.255.255.255]? 172.16.101.101
Name of configuration file[rtr2-confg]? host2-confg
Configure using host2-confg from 172.16.101.101?[confirm]
Connected to 172.16.101.101
Loading 1112 byte file host2-confg:![OK]
[OK]
device#
%SYS-5-CONFIG_NV:Non-volatile store configured from host2-config by rcp from 172.16.101.101
```

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from an FTP Server to the Device

To copy a configuration file from an FTP server to the running configuration or startup configuration, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	(Optional) Allows you to enter global configuration mode. This step is required only if you want to override the default remote username or password (see Steps 3 and 4).
Step 3	**ip ftp username** *username* **Example:** `Device(config)# ip ftp username NetAdmin1`	(Optional) Specifies the default remote username.
Step 4	**ip ftp password** *password* **Example:** `Device(config)# ip ftp password adminpassword`	(Optional) Specifies the default password.
Step 5	**end** **Example:** `Device(config)# end`	(Optional) Exits global configuration mode. This step is required only if you override the default remote username or password (see Steps 3 and 4).
Step 6	Do one of the following: • **copy ftp:** [[[//[*username*[**:***password*]**@**]*location*] **/***directory*]**/***filename*]**system:running-config** • **copy ftp:** [[[*/username*[*:password*]*@*]*location*]*/directory*]*/filename*]**nvram:startup-config** **Example:** `Device# copy ftp:nvram:startup-config`	Using FTP copies the configuration file from a network server to running memory or the startup configuration.

Examples

Copy FTP Running-Config

The following example copies a host configuration file named host1-confg from the netadmin1 directory on the remote server with an IP address of 172.16.101.101, and loads and runs the commands on the device:

```
device# copy ftp://netadmin1:mypass@172.16.101.101/host1-confg system:running-config
Configure using host1-confg from 172.16.101.101? [confirm]
Connected to 172.16.101.101
Loading 1112 byte file host1-confg:![OK]
```

```
device#
%SYS-5-CONFIG: Configured from host1-config by ftp from 172.16.101.101
```

Copy FTP Startup-Config

The following example specifies a remote username of netadmin1. Then it copies the configuration file named host2-confg from the netadmin1 directory on the remote server with an IP address of 172.16.101.101 to the startup configuration:

```
device# configure terminal
device(config)# ip ftp username netadmin1
device(config)# ip ftp password mypass
device(config)# end
device# copy ftp: nvram:startup-config
Address of remote host [255.255.255.255]? 172.16.101.101
Name of configuration file[host1-confg]? host2-confg
Configure using host2-confg from 172.16.101.101?[confirm]
Connected to 172.16.101.101
Loading 1112 byte file host2-confg:![OK]
[OK]
device#
%SYS-5-CONFIG_NV:Non-volatile store configured from host2-config by ftp from 172.16.101.101
```

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Maintaining Configuration Files Larger than NVRAM

To maintain a configuration file that exceeds the size of NVRAM, perform the tasks described in the following sections:

Compressing the Configuration File

To compress configuration files, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**service compress-config** **Example:** `Device(config)# service compress-config`	Specifies that the configuration file be compressed.
Step 4	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 5	Do one of the following: • Use FTP, RCP, or TFTP to copy the new configuration. • **configure terminal** **Example:** `Device# configure terminal`	Enters the new configuration: • If you try to load a configuration that is more than three times larger than the NVRAM size, the following error message is displayed: "[buffer overflow - *file-size* /*buffer-size* bytes]."
Step 6	**copy system:running-config nvram:startup-config** **Example:** `Device(config)# copy system:running-config nvram:startup-config`	When you have finished changing the running-configuration, save the new configuration.

Examples

The following example compresses a 129-KB configuration file to 11 KB:

```
Device# configure terminal

Device(config)# service compress-config

Device(config)# end

Device# copy tftp://172.16.2.15/tokyo-confg system:running-config

Configure using tokyo-confg from 172.16.2.155? [confirm] y

Booting tokyo-confg from 172.16.2.155:!!! [OK - 874/16000 bytes]
Device# copy system:running-config nvram:startup-config

Building configuration...
Compressing configuration from 129648 bytes to 11077 bytes
[OK]
```

Storing the Configuration in Flash Memory on Class A Flash File Systems

To store the startup configuration in flash memory, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy nvram:startup-config** *flash-filesystem:filename* **Example:** `Device# copy nvram:startup-config usbflash0:switch-config`	Copies the current startup configuration to the new location to create the configuration file.
Step 3	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 4	**boot config flash-filesystem:** *filename* **Example:** `Device(config)# boot config usbflash0:switch-config`	Specifies that the startup configuration file be stored in flash memory by setting the CONFIG_FILE variable.
Step 5	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 6	Do one of the following: • Use FTP, RCP, or TFTP to copy the new configuration. If you try to load a configuration that is more than three times larger than the NVRAM size, the following error message is displayed: "[buffer overflow - *file-size* /*buffer-size* bytes]. " • **configure terminal** **Example:** `Device# configure terminal`	Enters the new configuration.

	Command or Action	Purpose
Step 7	**copy system:running-config nvram:startup-config** **Example:** `Device(config)# copy system:running-config nvram:startup-config`	When you have finished changing the running-configuration, save the new configuration.

Examples

The following example stores the configuration file in usbflash0:

```
Device# copy nvram:startup-config usbflash0:switch-config

Device# configure terminal

Device(config)# boot config usbflash0:switch-config

Device(config)# end

Device# copy system:running-config nvram:startup-config
```

Loading the Configuration Commands from the Network

To use a network server to store large configurations, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy system:running-config** {**ftp:** | **rcp:** | **tftp:**} **Example:** `Device# copy system:running-config ftp:`	Saves the running configuration to an FTP, RCP, or TFTP server.
Step 3	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 4	**boot system** {**ftp:**[[[//[*username* [**:***password*]**@**]*location*]/*directory*]/*filename*] | **rcp:**[[[//[*username***@**]*location*]/*directory*]/*filename*] | **tftp:**[[[//*location*]/*directory*]/*filename*]} **Example:** `Device(config)# boot system ftp://user1:guessme@example.com/dir10/file1`	Specifies that the startup configuration file be loaded from the network server at startup.
Step 5	**service config** **Example:** `Device(config)# service config`	Enables the switch to download configuration files at system startup.
Step 6	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 7	**copy system:running-config nvram:startup-config** **Example:** `Device# copy system:running-config nvram:startup-config`	Saves the configuration.

Copying Configuration Files from Flash Memory to the Startup or Running Configuration

To copy a configuration file from flash memory directly to your startup configuration in NVRAM or your running configuration, enter one of the commands in Step 2:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	Do one of the following:	• Loads a configuration file directly into NVRAM or

	Command or Action	Purpose
	• **copy** *filesystem*:[*partition-number***:**][*filename*] **nvram:startup-config** • **copy** *filesystem*:[*partition-number***:**][*filename*] **system:running-config** **Example:** `Device# copy usbflash0:4:ios-upgrade-1 nvram:startup-config`	• Copies a configuration file to your running configuration

Examples

The following example copies the file named ios-upgrade-1 from partition 4 of the flash memory PC Card in usbflash0 to the device startup configurations:

```
Device# copy usbflash0:4:ios-upgrade-1 nvram:startup-config

Copy 'ios-upgrade-1' from flash device as 'startup-config' ? [yes/no] yes

[OK]
```

Copying Configuration Files Between Flash Memory File Systems

On platforms with multiple flash memory file systems, you can copy files from one flash memory file system, such as internal flash memory to another flash memory file system. Copying files to different flash memory file systems lets you create backup copies of working configurations and duplicate configurations for other devices. To copy a configuration file between flash memory file systems, use the following commands in EXEC mode:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show** *source-filesystem*: **Example:** `Device# show flash:`	Displays the layout and contents of flash memory to verify the filename.
Step 3	**copy** *source-filesystem*:[*partition-number***:**][*filename*] *dest-filesystem***:**[*partition-number***:**][*filename*]	Copies a configuration file between flash memory devices.

	Command or Action	Purpose
	Example: `Device# copy flash: usbflash0:`	• The source device and the destination device cannot be the same. For example, the **copy usbflash0: usbflash0:** command is invalid.

Example

The following example copies the file named running-config from partition 1 on internal flash memory to partition 1 of usbflash0 on a device. In this example, the source partition is not specified, so the device prompts for the partition number:

```
Device# copy flash: usbflash0:

System flash
Partition   Size    Used      Free      Bank-Size  State          Copy Mode
  1         4096K   3070K     1025K     4096K      Read/Write     Direct
  2        16384K   1671K    14712K     8192K      Read/Write     Direct
[Type ?<no> for partition directory; ? for full directory; q to abort]
Which partition? [default = 1]
System flash directory, partition 1:
File  Length   Name/status
  1   3142748  dirt/network/mars-test/c3600-j-mz.latest
  2   850      running-config
[3143728 bytes used, 1050576 available, 4194304 total]
usbflash0 flash directory:
File  Length   Name/status
  1   1711088  dirt/gate/c3600-i-mz
  2   850      running-config
[1712068 bytes used, 2482236 available, 4194304 total]
Source file name? running-config

Destination file name [running-config]?
Verifying checksum for 'running-config' (file # 2)...  OK
Erase flash device before writing? [confirm]
Flash contains files. Are you sure you want to erase? [confirm]
Copy 'running-config' from flash: device
  as 'running-config' into usbflash0: device WITH erase? [yes/no] yes

Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee ...erased!

 [OK - 850/4194304 bytes]
Flash device copy took 00:00:30 [hh:mm:ss]
Verifying checksum...  OK (0x16)
```

Copying a Configuration File from an FTP Server to Flash Memory Devices

To copy a configuration file from an FTP server to a flash memory device, complete the task in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	(Optional) Enters global configuration mode. This step is required only if you override the default remote username or password (see Steps 3 and 4).
Step 3	**ip ftp username** *username* **Example:** `Device(config)# ip ftp username Admin01`	(Optional) Specifies the remote username.
Step 4	**ip ftp password** *password* **Example:** `Device(config)# ip ftp password adminpassword`	(Optional) Specifies the remote password.
Step 5	**end** **Example:** `Device(config)# end`	(Optional) Exits configuration mode. This step is required only if you override the default remote username (see Steps 3 and 4).
Step 6	**copy ftp:** [[*//location*]*/directory*]*/bundle_name* **flash:** **Example:** `Device>copy ftp:/cat9k_iosxe.16.11.01.SPA.bin flash:`	Copies the configuration file from a network server to the flash memory device using FTP.

What to Do Next

After you have issued the **copy** EXEC command, you may be prompted for additional information or for confirmation of the action. The prompt displayed depends on how much information you provide in the **copy** command and the current setting of the **file prompt** global configuration command.

Copying a Configuration File from an RCP Server to Flash Memory Devices

To copy a configuration file from an RCP server to a flash memory device, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable**	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: `Device> enable`	• Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	(Optional) Enters global configuration mode. This step is required only if you override the default remote username or password (see Step 3).
Step 3	**ip rcmd remote-username** *username* **Example:** `Device(config)# ip rcmd remote-username Admin01`	(Optional) Specifies the remote username.
Step 4	**end** **Example:** `Device(config)# end`	(Optional) Exits configuration mode. This step is required only if you override the default remote username or password (see Step 3).
Step 5	**copy rcp:** [[[*//*[*username@*]*location*]*/directory*] */bundle_name*] **flash:** **Example:** `Device# copy rcp://netadmin@172.16.101.101/bundle1 flash:`	Copies the configuration file from a network server to the flash memory device using RCP. Respond to any device prompts for additional information or confirmation. Prompting depends on how much information you provide in the **copy** command and the current setting of the **file prompt** command.

Copying a Configuration File from a TFTP Server to Flash Memory Devices

To copy a configuration file from a TFTP server to a flash memory device, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy tftp:** [[[*//location*]*/directory*]/bundle_name **flash:** **Example:** `Device# copy`	Copies the file from a TFTP server to the flash memory device. Reply to any device prompts for additional information or confirmation. Prompting depends on how much information you provide in the **copy** command and the current setting of the **file prompt** command.

	Command or Action	Purpose
	tftp://cat3k_caa-universalk9.SSA.03.12.02.EZP.150-12.02.EZP.150-12.02.EZP.bin flash:	

Examples

The following example shows the copying of the configuration file named switch-config from a TFTP server to the flash memory card inserted in usbflash0. The copied file is renamed new-config.

```
Device#
copy tftp:switch-config usbflash0:new-config
```

Re-executing the Configuration Commands in the Startup Configuration File

To re-execute the commands located in the startup configuration file, complete the task in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure memory** **Example:** `Device# configure memory`	Re-executes the configuration commands located in the startup configuration file.

Clearing the Startup Configuration

You can clear the configuration information from the startup configuration. If you reboot the device with no startup configuration, the device enters the Setup command facility so that you can configure the device from scratch. To clear the contents of your startup configuration, complete the task in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**erase nvram** **Example:** `Device# erase nvram`	Clears the contents of your startup configuration. **Note** For all platforms except the Class A Flash file system platforms, this command erases NVRAM. The startup configuration file cannot be restored once it has been deleted. On Class A Flash file system platforms, when you use the **erase startup-config** EXEC command, the device erases or deletes the configuration pointed to by the CONFIG_FILE environment variable. If this variable points to NVRAM, the device erases NVRAM. If the CONFIG_FILE environment variable specifies a flash memory device and configuration filename, the device deletes the configuration file. That is, the device marks the file as "deleted," rather than erasing it. This feature allows you to recover a deleted file.

Deleting a Specified Configuration File

To delete a specified configuration on a specific flash device, complete the task in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**delete** *flash-filesystem*:*filename* **Example:** `Device# delete usbflash0:myconfig`	Deletes the specified configuration file on the specified flash device. **Note** On Class A and B Flash file systems, when you delete a specific file in flash memory, the system marks the file as deleted, allowing you to later recover a deleted file using the **undelete** EXEC command. Erased files cannot be recovered. To permanently erase the configuration file, use the **squeeze** EXEC command. On Class C Flash file systems, you cannot recover a file that has been deleted. If you attempt to erase or delete the configuration

	Command or Action	Purpose
		file specified by the CONFIG_FILE environment variable, the system prompts you to confirm the deletion.

Specifying the CONFIG_FILE Environment Variable on Class A Flash File Systems

On Class A flash file systems, you can configure the Cisco IOS software to load the startup configuration file specified by the CONFIG_FILE environment variable. The CONFIG_FILE variable defaults to NVRAM. To change the CONFIG_FILE environment variable, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**copy** [*flash-url* | *ftp-url* | *rcp-url* | *tftp-url* | **system:running-config** | **nvram:startup-config**] *dest-flash-url* **Example:** `Device# copy system:running-config nvram:startup-config`	Copies the configuration file to the flash file system from which the device loads the file on restart.
Step 3	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 4	**boot config** *dest-flash-url* **Example:** `Device(config)# boot config 172.16.1.1`	Sets the CONFIG_FILE environment variable. This step modifies the runtime CONFIG_FILE environment variable.
Step 5	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 6	**copy system:running-config nvram:startup-config** **Example:**	Saves the configuration performed in Step 3 to the startup configuration.

	Command or Action	Purpose
	`Device# copy system:running-config nvram:startup-config`	
Step 7	**show boot** **Example:** `Device# show boot`	(Optional) Allows you to verify the contents of the CONFIG_FILE environment variable.

Examples

The following example copies the running configuration file to the device. This configuration is then used as the startup configuration when the system is restarted:

```
Device# copy system:running-config usbflash0:config2
Device# configure terminal
Device(config)# boot config usbflash0:config2
Device(config)# end
Device# copy system:running-config nvram:startup-config
[ok]
Device# show boot
BOOT variable = usbflash0:rsp-boot-m
CONFIG_FILE variable = nvram:
Current CONFIG_FILE variable = usbflash0:config2
Configuration register is 0x010F
```

What to Do Next

After you specify a location for the startup configuration file, the **nvram:startup-config** command is aliased to the new location of the startup configuration file. The **more nvram:startup-config** EXEC command displays the startup configuration, regardless of its location. The **erase nvram:startup-config** EXEC command erases the contents of NVRAM and deletes the file pointed to by the CONFIG_FILE environment variable.

When you save the configuration using the **copy system:running-config nvram:startup-config** command, the device saves a complete version of the configuration file to the location specified by the CONFIG_FILE environment variable and a distilled version to NVRAM. A distilled version is one that does not contain access list information. If NVRAM contains a complete configuration file, the device prompts you to confirm your overwrite of the complete version with the distilled version. If NVRAM contains a distilled configuration, the device does not prompt you for confirmation and proceeds with overwriting the existing distilled configuration file in NVRAM.

Note If you specify a file in a flash device as the CONFIG_FILE environment variable, every time you save your configuration file with the **copy system:running-config nvram:startup-config** command, the old configuration file is marked as "deleted," and the new configuration file is saved to that device. Eventually, Flash memory fills up as the old configuration files still take up memory. Use the **squeeze** EXEC command to permanently delete the old configuration files and reclaim the space.

Configuring the Device to Download Configuration Files

You can specify an ordered list of network configuration and host configuration filenames. The Cisco IOS XE software scans this list until it loads the appropriate network or host configuration file.

To configure the device to download configuration files at system startup, perform at least one of the tasks described in the following sections:

- Configuring the Device to Download the Network Configuration File , on page 32
- Configuring the Device to Download the Host Configuration File , on page 33

If the device fails to load a configuration file during startup, it tries again every 10 minutes (the default setting) until a host provides the requested files. With each failed attempt, the device displays the following message on the console terminal:

```
Booting host-confg... [timed out]
```

If there are any problems with the startup configuration file, or if the configuration register is set to ignore NVRAM, the device enters the Setup command facility.

Configuring the Device to Download the Network Configuration File

To configure the Cisco IOS software to download a network configuration file from a server at startup, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**boot system** {**ftp:**[[[//[*username* [**:***password*]**@**]*location*]/*directory*]/*filename*] | **rcp:**[[[//[*username***@**]*location*]/*directory*]/*filename*] | **tftp:**[[[//*location*]/*directory*]/*filename*]} **Example:** `Device(config)# boot system tftp:hostfile1`	Specifies the network configuration file to download at startup, and the protocol to be used (TFTP, RCP, or FTP). • If you do not specify a network configuration filename, the Cisco IOS software uses the default filename network-confg. If you omit the address, the device uses the broadcast address. • You can specify more than one network configuration file. The software tries them

	Command or Action	Purpose
		in order entered until it loads one. This procedure can be useful for keeping files with different configuration information loaded on a network server.
Step 4	**service config** **Example:** `Device(config)# service config`	Enables the system to automatically load the network file on restart.
Step 5	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 6	**copy system:running-config nvram:startup-config** **Example:** `Device# copy system:running-config nvram:startup-config`	Saves the running configuration to the startup configuration file.

Configuring the Device to Download the Host Configuration File

To configure the Cisco IOS software to download a host configuration file from a server at startup, complete the tasks in this section:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**boot host** {**ftp:**[[[//[*username* [**:***password*]**@**]*location*]/*directory*]/*filename*] | **rcp:**[[[//[*username***@**]*location*]/*directory*]/*filename*] | **tftp:**[[[//*location*]/*directory*]/*filename*] } **Example:**	Specifies the host configuration file to download at startup, and the protocol to be used (FTP, RCP, or TFTP): • If you do not specify a host configuration filename, the device uses its own name to form a host configuration filename by

	Command or Action	Purpose
	`Device(config)# boot host tftp:hostfile1`	converting the name to all lowercase letters, removing all domain information, and appending "-confg." If no host name information is available, the software uses the default host configuration filename device-confg. If you omit the address, the device uses the broadcast address. • You can specify more than one host configuration file. The Cisco IOS software tries them in order entered until it loads one. This procedure can be useful for keeping files with different configuration information loaded on a network server.
Step 4	**service config** **Example:** `Device(config)# service config`	Enables the system to automatically load the host file upon restart.
Step 5	**end** **Example:** `Device(config)# end`	Exits global configuration mode.
Step 6	**copy system:running-config nvram:startup-config** **Example:** `Device# copy system:running-config nvram:startup-config`	Saves the running configuration to the startup configuration file.

Example

In the following example, a device is configured to download the host configuration file named hostfile1 and the network configuration file named networkfile1. The device uses TFTP and the broadcast address to obtain the file:

```
Device# configure terminal
Device(config)# boot host tftp:hostfile1
Device(config)# boot system tftp:networkfile1
Device(config)# service config
Device(config)# end
Device# copy system:running-config nvram:startup-config
```

Feature History for Managing Configuration Files

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Everest 16.6.1	Managing Configuration Files	Configuration files contain the Cisco IOS software commands used to customize the functionality of your Cisco device. Commands are parsed (translated and executed) by the Cisco IOS software when the system is booted (from the startup-config file) or when you enter commands at the CLI in a configuration mode.

Use Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn.